CLAIMS

1. (currently amended) A method for encoding a video stream to generate an encoded video bitstream, comprising the steps of:

    (a) encoding, into the encoded video bitstream, a first original frame/region in the video stream using intra-frame coding to generate an encoded first frame/region; and

    (b) encoding, into the encoded video bitstream, a second original frame/region in the video stream using motion-based predictive coding, wherein:

        the motion-based predictive coding comprises motion computation adapted to generate motion information using during the motion-based predictive coding; and

        at least some of the motion information used during the motion-based predictive coding is excluded from the encoded video bitstream.

2. (original) The invention of claim 1, wherein all of the motion information used during the motion-based predictive coding is excluded from the encoded video bitstream and the encoded video bitstream does not explicitly include any motion information.

3. (original) The invention of claim 1, wherein step (b) comprises the steps of:

    (1) decoding the encoded first frame/region to generate a decoded first frame/region;

    (2) encoding the second original frame/region to generate an encoded second frame/region;

    (3) decoding the encoded second frame/region to generate a decoded second frame/region;

    (4) performing motion computation between the decoded second frame/region and the decoded first frame/region to generate the motion information;

    (5) applying the motion information to the decoded first frame/region to generate a synthesized second frame/region;

    (6) performing inter-frame differencing between the synthesized second frame/region and the second original frame/region to generate residual errors; and

    (7) encoding, into the encoded video bitstream, at least some of the residual errors.

4. (original) The invention of claim 1, further comprising the step of:

    (c) encoding, into the encoded video bitstream, a third original frame/region in the video stream using tweening based on the motion information used to encode the second original frame/region.

5. (currently amended) A video encoder for encoding a video stream to generate an encoded video bitstream, comprising:

    (a) a frame/region type selector configured for selecting different processing paths for encoding different frames/regions into the encoded video bitstream;

    (b) a first processing path configured for encoding, into the encoded video bitstream, a first original frame/region in the video stream using intra-frame coding to generate an encoded first frame/region; and

    (c) a second processing path configured for encoding, into the encoded video bitstream, a second original frame/region in the video stream using motion-based predictive coding, wherein:

        the motion-based predictive coding comprises motion computation adapted to generate motion information using during the motion-based predictive coding; and

        the video encoder has an encoding mode in which at least some of the motion information used during the motion-based predictive coding is excluded from the encoded video bitstream.

6. (original) The invention of claim 5, wherein the video encoder is a scaleable video encoder that can be operated at a plurality of different encoding modes, wherein:

3   in a first encoding mode, all of the motion information is excluded from the encoded video
4 bitstream and the encoded video bitstream does not explicitly include any motion information; and
5   in a second encoding mode, at least some of the motion information is encoded into the encoded
6 video bitstream.

1   7.   (original) The invention of claim 6, wherein:
2   in the second encoding mode, a first portion of the motion information is encoded into the
3 encoded video bitstream and a second portion of the motion information is excluded from the encoded
4 video bitstream; and
5   in a third encoding mode, all of the motion information is encoded into the encoded video
6 bitstream.

1   8.   (original) The invention of claim 5, wherein:
2   the first processing path is configured for decoding the encoded first frame/region to generate a
3 decoded first frame/region; and
4   the second processing path is configured for:
5   (1)   encoding the second original frame/region to generate an encoded second
6 frame/region;
7   (2)   decoding the encoded second frame/region to generate a decoded second
8 frame/region;
9   (3)   performing motion computation between the decoded second frame/region and
10 the decoded first frame/region to generate the motion information;
11   (4)   applying the motion information to the decoded first frame/region to generate a
12 synthesized second frame/region;
13   (5)   performing inter-frame differencing between the synthesized second
14 frame/region and the second original frame/region to generate residual errors; and
15   (6)   encoding, into the encoded video bitstream, at least some of the residual errors.

1   9.   (original) The invention of claim 8, wherein the encoding in the first processing path
2 and the encoding of the second original frame/region in the second processing path are based on
3 intra-frame wavelet encoding.

1   10.   (original) The invention of claim 8, wherein:
2   the first processing path is configured for intra-frame coding the first original frame/region at a
3 high resolution;
4   the decoded first frame/region is at the high resolution;
5   the second processing path is configured for:
6   (i)   spatially sub-sampling the second original image/region to generate a
7 low-resolution second frame/region having a resolution lower than the high resolution; and
8   (ii)   intra-frame coding the low-resolution second frame/region to generate the
9 encoded second frame/region;
10   the decoded second frame/region is at the low resolution; and
11   the synthesized second frame/region is at the high resolution.

1   11.   (original) The invention of claim 8, wherein the second processing path is configured
2 for:
3   (i)   thresholding the residual errors to generate binary data; and
4   (ii)   encoding, into the encoded video bitstream, the at least some of the residual errors based
5 on the binary data.

12. (original) The invention of claim 5, further comprising a third processing path configured for encoding, into the encoded video bitstream, a third original frame/region in the video stream using tweening based on the motion information used to encode the second original frame/region.

13. (original) The invention of claim 12, wherein:
the first processing path is configured for decoding the encoded first frame/region to generate a decoded first frame/region; and
the third processing path is configured for:
(1) temporally interpolating the motion information used to encode the second original frame/region;
(2) applying the temporally interpolated motion information to the decoded first frame/region to generate a synthesized third frame/region;
(3) generating residual errors between the synthesized third frame/region and the third original frame/region; and
(4) encoding, into the encoded video bitstream, at least some of the residual errors.

14. (original) The invention of claim 13, wherein:
the first processing path is configured for intra-frame coding the first original frame/region at a high resolution;
the decoded first frame/region is at the high resolution;
the synthesized third frame/region is at the high resolution; and
the third processing path is configured for performing inter-frame differencing between the synthesized third frame/region and the third original frame/region to generate the residual errors.

15. (original) A method for decoding an encoded video bitstream to generate a decoded video stream, comprising the steps of:
(a) decoding, from the encoded video bitstream, an encoded first frame/region using intra-frame decoding to generate a decoded first frame/region; and
(b) decoding, from the encoded video bitstream, an encoded second frame/region using motion-based predictive decoding, wherein at least some motion information used during the motion-based predictive decoding is generated by performing motion computation as part of the decoding method.

16. (original) The invention of claim 15, wherein the encoded video bitstream does not explicitly include any motion information and all of the motion information used during the motion-based predictive decoding is generated as part of the method.

17. (original) The invention of claim 15, wherein step (b) comprises the steps of:
(1) decoding, from the encoded video bitstream, the encoded second frame/region to generate a decoded second frame/region;
(2) performing the motion computation between the decoded second frame/region and the decoded first frame/region to generate the motion information;
(3) applying the motion information to the decoded first frame/region to generate a synthesized second frame/region;
(4) decoding, from the encoded video bitstream, encoded residual errors to generate decoded residual errors corresponding to the synthesized second frame/region; and
(5) performing inter-frame addition between the decoded residual errors and the synthesized second frame/region to generate an error-corrected decoded second frame/region.

18. (original) The invention of claim 15, further comprising the step of:

2   (c)   generating a decoded third frame/region using tweening based on the motion information
3   used to decode the encoded second frame/region.

1   19.   (original) The invention of claim 15, further comprising the step of de-interlacing a
2   decoded second frame/region generated during step (b) to generate two corresponding fields
3   corresponding to the decoded second frame/region.

1   20.   (original) A video decoder for decoding an encoded video bitstream to generate a
2   decoded video stream, comprising:
3   (a)   a frame/region type selector configured for selecting different processing paths for
4   decoding different encoded frames/regions from the encoded video bitstream;
5   (b)   a first processing path configured for decoding, from the encoded video bitstream, an
6   encoded first frame/region in the video stream using intra-frame decoding to generate a decoded first
7   frame/region; and
8   (c)   a second processing path configured for decoding, from the encoded video bitstream, an
9   encoded second frame/region in the video stream using motion-based predictive decoding, wherein the
10   video decoder has a decoding mode in which at least some motion information used during the
11   motion-based predictive decoding is generated by the video decoder performing motion computation.

1   21.   (original) The invention of claim 20, wherein the video decoder is a scaleable video
2   decoder that can be operated at a plurality of different decoding modes, wherein:
3   in a first decoding mode, the encoded video bitstream does not explicitly include any motion
4   information and all of the motion information is generated by performing the motion computation by the
5   video decoder; and
6   in a second decoding mode, at least some of the motion information is decoded from the encoded
7   video bitstream.

1   22.   (original) The invention of claim 21, wherein:
2   in the second decoding mode, a first portion of the motion information is decoded from the
3   encoded video bitstream and a second portion of the motion information is generated by performing the
4   motion computation by the video decoder; and
5   in a third decoding mode, all of the motion information is decoded from the encoded video
6   bitstream.

1   23.   (original) The invention of claim 20, wherein:
2   the second processing path is configured for:
3   (1)   decoding, from the encoded video bitstream, the encoded second frame/region to
4   generate a decoded second frame/region;
5   (2)   performing the motion computation between the decoded second frame/region
6   and the decoded first frame/region to generate the motion information;
7   (3)   applying the motion information to the decoded first frame/region to generate a
8   synthesized second frame/region;
9   (4)   decoding, from the encoded video bitstream, encoded residual errors to generate
10   decoded residual errors corresponding to the synthesized second frame/region; and
11   (5)   performing inter-frame addition between the decoded residual errors and the
12   synthesized second frame/region to generate an error-corrected decoded second frame/region.

1   24.   (original) The invention of claim 23, wherein the decoding in the first processing path
2   and the decoding of the second encoded frame/region in the second processing path are based on
3   intra-frame wavelet decoding.

25.   (original) The invention of claim 23, wherein:
the decoded first frame/region is at a high resolution;
the decoded second frame/region is at a low resolution lower than the high resolution;
the synthesized second frame/region is at the high resolution; and
the error-corrected decoded second frame/region is at the high resolution.

26.   (original) The invention of claim 20, further comprising a third processing path
configured for generating a decoded third frame/region using tweening based on the motion information
used to decode the encoded second frame/region.

27.   (original) The invention of claim 26, wherein the third processing path is configured for:
(1)   temporally interpolating the motion information used to decode the encoded second
frame/region; and
(2)   applying the temporally interpolated motion information to the decoded first
frame/region to generate the decoded third frame/region.

28.   (original) The invention of claim 27, wherein the decoded third frame/region is not
explicitly represented in the encoded video bitstream.

29.   (original) The invention of claim 27, wherein the third processing path is configured for:
(i)   applying the temporally interpolated motion information to the decoded first
frame/region to generate a synthesized third frame/region;
(ii)   decoding, from the encoded video bitstream, encoded residual errors for an encoded third
frame/region to generate decoded residual errors; and
(iii)   applying the decoded residual errors to the synthesized third frame/region to generate the
decoded third frame/region.

30.   (original) The invention of claim 29, wherein:
the decoded first frame/region is at a high resolution;
the synthesized third frame/region is at the high resolution; and
the third processing path is configured for performing inter-frame addition between the
synthesized third frame/region and the decoded residual errors to generate the decoded third frame/region
at the high resolution.

31.   (original) The invention of claim 20, wherein the second processing path is configured
for de-interlacing a decoded second frame/region to generate two corresponding fields corresponding to
the decoded second frame/region.

32-35. (canceled)

36.   (previously presented) The invention of claim 1, wherein the motion-based predictive
coding comprises:
motion computation during which one or more motion vectors are determined for the second
original frame/region; and
motion compensation based on the one or more motion vectors determined during motion
computation, wherein at least one of the motion vectors used during the motion compensation is excluded
from the encoded video bitstream.

37.   (previously presented) The invention of claim 36, wherein each motion vector used
during the motion compensation is excluded from the encoded video bitstream.

1   38.   (previously presented) The invention of claim 15, wherein the motion-based predictive
2 decoding further comprises motion compensation for the encoded second frame/region based on one or
3 more motion vectors, wherein at least one of the motion vectors used during the motion compensation is
4 determined during the motion computation.

1   39.   (previously presented) The invention of claim 38, wherein each motion vector used
2 during the motion compensation is determined during the motion computation.